1) $2\cdot\left(2x - \frac{1}{2}y\right)^5$

$1(2x)^5\left(-\frac{1}{2}y\right)^0 + 5(2x)^4\left(-\frac{1}{2}y\right)^1 + 10(2x)^3\left(-\frac{1}{2}y\right)^2 + 10(2x)^2\left(-\frac{1}{2}y\right)^3$

$+ 5(2x)^1\left(-\frac{1}{2}y\right)^4 + 1(2x)^0\left(-\frac{1}{2}y\right)^5$

$2\left[32x^5 - 40x^4y + 20x^3y^2 - 5x^2y^3 + \frac{5}{8}xy^4 - \frac{1}{32}y^5\right]$

$64x^5 - 80x^4y + 40x^3y^2 - 10x^2y^3 + \frac{5}{4}xy^4 - \frac{1}{16}y^5$

2)

$$\left[(3i-2)^2\right]^2 - 2(i+3)^2 \cdot \left[(1-2i)^2\right]^2$$

$$(-11i-5)^2 - 2\cdot\left[(6i+8)\cdot(-4i-3)^2\right]$$

$$120i - 119 - 4\cdot\left[(3i+4)(24i-7)\right]$$

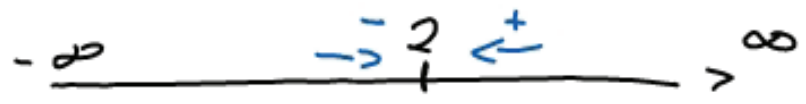
$$120i - 119 - 4\cdot(-72-21i+96i-28)$$

$$120i - 119 - 4\cdot(-100+75i)$$

$$120i - 119 + 400 - 300i$$

$$-180i + 281$$

3) $f(x) = 4 - \frac{3}{2-x}$ $\quad D = \mathbb{R} \setminus \{2\}$

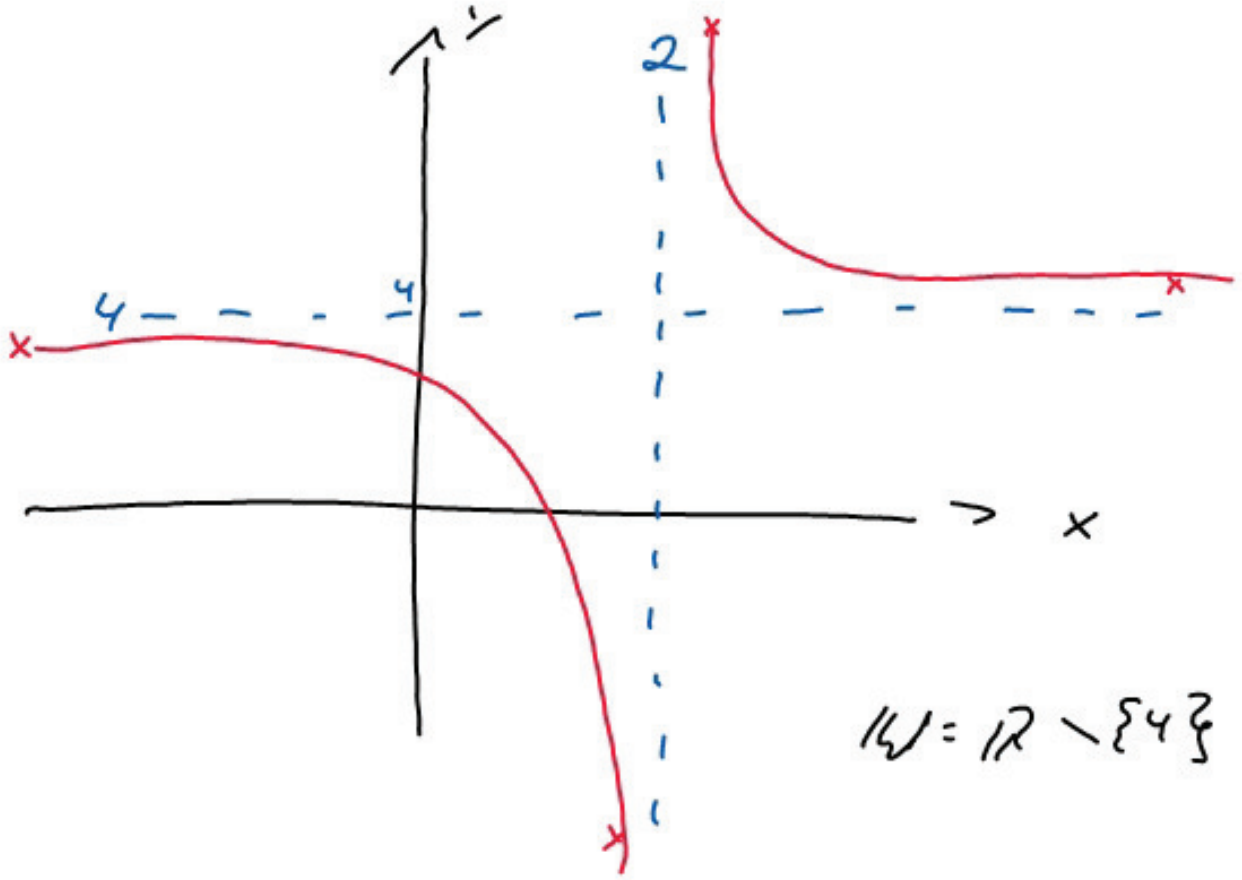


$\lim_{x \to -\infty} f(x) = \left[4 - \frac{3}{\infty}\right] = \left[4 - 0^+\right] = 4^-$

$\lim_{x \to \infty} f(x) = \left[4 - \frac{3}{-\infty}\right] = \left[4 - 0^-\right] = 4^+$

$\lim_{x \to 2^+} f(x) = \left[4 - \frac{3}{0^-}\right] = \left[4 - (-\infty)\right] = \infty$

$\lim_{x \to 2^-} f(x) = \left[4 - \frac{3}{0^+}\right] = \left[4 - \infty\right] = -\infty$



$W = \mathbb{R} \setminus \{4\}$

4) a) (360; 108)

$360 = 2 \cdot 180 = 2 \cdot 2 \cdot 90 = 2 \cdot 2 \cdot 2 \cdot 45 = 2 \cdot 2 \cdot 2 \cdot 3 \cdot 15$

$= 2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \cdot 5$ $\cdot 3$

$108 = 2 \cdot 54 = 2 \cdot 2 \cdot 27 = 2 \cdot 2 \cdot 3 \cdot 9$

$= 2 \cdot 2 \cdot 3 \cdot 3 \cdot 3$ $\cdot 10$

ggT (360; 108) $= 2 \cdot 2 \cdot 3 \cdot 3 = 36$

kürzen

kgV (360; 108) = 1080

erweitern

POLYNOMDIVISION

$(x+a)(x+b)(x+c)$

$f(x) = x^3 + 2x^2 - 13x + 10$ → Nullstellen $f(x) = 0$

$1234{,}56 : 7 = 17$

$-\ 7$

$534{,}6$

-49

$\mathbb{N} = \{\pm 1; \pm 2; \pm 5; \pm 1$

$f(1) = 0$ $(x-1)$

$(x^3 + 2x^2 - 13x + 10) : (x-1) = x^2 + 3x - 10$

$-(x^3 - x^2)$

$3x^2 - 13x + 10$

$-(3x^2 - 3x)$

$-10x + 10$

$-(-10x + 10)$

$(x+5)(x-2)$

$\mathbb{L} = \{-5; 1; 2\}$

$(x^3 - 2x^2 - 5x + 6) : (x-1) = x^2 - x - 6$

$-(x^3 - x^2)$

$-x^2 - 5x + 6$

$-(-x^2 + x)$

$-6x + 6$

$-(-6x + 6)$

0

$(x+2)(x-3)$

$(x-1)(x+2)(x-3) = 0$

$\mathbb{L} = \{-2; 1; 3\}$

$(x^4 - x^3 - 7x^2 + x + 6) : (x - 1) = x^3 - 7x - 6$

$-(x^4 - x^3)$

$-7x^2 + x + 6$

$-(-7x^2 + 7x)$

$-6x + 6$

$-(-6x + 6)$

0

$+0x^2$

$(x^3 - 7x - 6) : (x - 3) = x^2 + 3x + 2$

$-(x^3 - 3x^2)$

$3x^2 - 7x - 6$

$-(3x^2 - 9x)$

$2x - 6$

$-(2x - 6)$

$x^2 + 3x + 2$

$(x + 2)(x + 1)$

$\mathbb{L} = \{-2; -1; 1; 3\}$